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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/655,769

09/05/2003

Haruhisa Soda

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01/14/2005

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EXAMINER

LE, THIEN MINH

ART UNIT

PAPER NUMBER

2876

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/655,769

Applicant(s)

SODA ET AL.

Examiner

Thien M. Le

Art Unit

2876

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17 is/are allowed.
- 6) ☒ Claim(s) 18-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### DETAILED ACTION

The information disclosure statement filed on 9/5/2003 has been entered.

Claims 1-32 are presented for examination.

#### ***Specification***

The disclosure is objected to because of the following informalities:  
continuation data is not specified in the specification. Appropriate correction is respectfully required.

#### ***Double Patenting***

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 18-32 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1- of prior U.S. Patent No. 6,836,573. This is a double patenting rejection.

Identical to claims 18-32 of the instant application, claims 1-15 of U.S. Patent No. 6,836,573 in that the claims recite:

1. A semiconductor optical modulator comprising: a) a first optical

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directional coupler on a semiconductor substrate; b) a second optical directional coupler on said semiconductor substrate; c) a first optical waveguide; d) a second optical waveguide; e) a wave-coupling region for the first waveguide and the second waveguide between the directional couplers; f) a pair of traveling-wave electrodes, said traveling-wave electrodes having no crossover; and g) two sets of air-bridge structures forming connections between the waveguide region and the traveling-wave electrodes.

2. The optical modulator according to claim 1 wherein the wave-coupling region includes an optical waveguide crossover.

3. The optical modulator according to claim 1 wherein the optical waveguides have proximate regions formed of P-I-N structures on a conductive semiconductor layer, the proximate regions operating as directional couplers controlled by bias voltages supplied to a waveguide electrode provided through a traveling wave electrode to switch optical signals propagating through the waveguides to each other and wherein the first directional coupler is cascaded with the second directional coupler through the waveguide coupling region.

4. The optical modulator according to claim 2 wherein the traveling wave electrodes are operative to propagate high-speed electronic signals from a signal input pad to the waveguide electrodes through the air-bridge structures.

5. The optical modulator according to claim 3, wherein the first pair of electrodes or the second pair of electrodes on the optical waveguides are divided and disposed along a longitudinal axis, wherein each electrode is connected by the air-bridge structures individually to the outer traveling-wave electrode.

6. The optical modulator according to claim 4, wherein the optical waveguide is a ridge waveguide.

7. The optical modulator according to claim 5 wherein the optical waveguide employs a ridgeless waveguide structure.

8. The optical modulator according to claim 5, wherein the optical waveguide is a buried hetero-structure (BH) waveguide.

9. The optical modulator according to claim 5, wherein the wave coupling region is coupled to said directional coupler with a cross state.

10. The optical modulator according to claim 5, wherein the wave coupling region is a 2.times.2 multi-mode interference (MMI) coupler.

11. The optical modulator according to claim 5, wherein the wave coupling

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region is an X waveguide.

12. The optical modulator according to claim 5, wherein divided electrodes are electrically isolated from each other.

13. The optical modulator according to claim 5, wherein one bias electrode is disposed at least on the conducting layer on the semiconductor substrate.

14. The optical modulator according to claim 5, wherein structure of said optical modulator comprises Type III-V compound materials.

15. The optical modulator according to claim 5, wherein structure of said optical modulator comprises type IV compound materials.

### ***Allowable Subject Matter***

Claim 1-17 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art discloses various semiconductor modulator comprising different combination of a first and a second directional coupler, a first and a second waveguide, and electrodes. However, the prior art fails to disclose an optical switch comprising a combination of a first and a second waveguides, a first and a second lead electrodes, a pair of first control electrodes, a pair of second control electrodes, and having the functions and characteristics as recited in claim 1.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien M. Le whose telephone number is

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(571) 272-2396. The examiner can normally be reached on Monday - Friday from 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on (571) 272-2398. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Le, Thien Minh**  
**Primary Examiner**  
**Art Unit 2876**  
**January 3, 2005**